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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,448	07/01/2003	Yingjian Chen	XYNANO-1	7746
7590	05/09/2005			EXAMINER WEISS, HOWARD
YINGJIAN CHEN 1123 WISTERIA DRIVE FREMONT, CA 94539			ART UNIT 2814	PAPER NUMBER

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/611,448 Examiner Howard Weiss	CHEN ET AL. Art Unit 2814
		PMU

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 06 March 2005.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-5,22,24,26 and 28 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-5,22,24,26 and 28 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

Attorney's Docket Number: XYNANO-1

Filing Date: 7/1/03

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Chen et al. (Dang)

Examiner: Howard Weiss

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Initially, and with respect to Claims 5, note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935).

Note that Applicant has burden of proof in such cases as the above case law makes clear.

3. Claims 1 to 5, 23, 25 and 27 are rejected under 35 U.S.C. § 103(a) as obvious over Shin et al. (U.S. Patent No. 6,515,339), Zhang et al. (U.S. Patent No. 6,764,874) and Mao et al. (U.S. Patent No. 6,798,127).

Shin et al. show most aspects of the instant invention (e.g. Figures 6 to 25) including:

- a source **210**, a drain **220**, a gate **230** and a channel **260** including a nanotube of submicron diameter (e.g. Figures 20 and 21 and Column 6 lines 50 to 61 and Column 10 Lines 7 to12)
- a plurality of electrodes connected to electronic devices and a plurality of conductive interconnects using nanotubes connecting the electrode and devices (e.g. Figures 15 to 17)

Shin et al. show most aspects of the instant invention (Paragraph 7) except for a magnetic nanoparticle attached to the exterior cylindrical wall of a nanotube and made of Co, Ni or Fe. Zhang et al. teach (e.g. Figure 9) to attach Ni, Co or Fe magnetic nanoparticles **53** to nanotubes **58** to form nanotubes at lower temperatures and precise alignment (Column 8 Lines 15 to 30). It would have been obvious to a person of ordinary skill in the art at the time of invention to attach Ni, Co or Fe magnetic nanoparticles to nanotubes as taught by Zhang et al. in the device of Shin et al. to form nanotubes at lower temperatures and precise alignment.

Mao et al. teach (e.g. Figure 1 and 7) to have nanoparticles **104** attached to the exterior wall of nanotubes **105** to hold or trap the nanotubes onto a substrate (Column 4 Lines 4 to 6). It would have been obvious to a person of ordinary skill in the art at the time of invention to have nanoparticles attached to the exterior wall of nanotubes to hold or trap the nanotubes onto a substrate

As to the grounds of rejection under "product by process", how the nanoparticles are attached to the nanotubes pertains to process limitations which do not affect the final device structure. See MPEP § 2113 which discusses the handling of "product by process" claims.

4. Claim 28 is rejected under 35 U.S.C. § 103(a) as obvious over Shin et al., Zhang et al. and Mao et al., as applied to Claim 26 above, and in further view of Honlein et al. (U.S. Patent No. 6,809,361).

Shin et al., Zhang et al. and Mao et al. show most aspects of the instant invention (Paragraph 3 ) except for the electronic device including an MRAM cell. Honlein et al. teach (e.g. Figure 2) to use nanotubes **203** in an MRAM cell **200** to provide a memory unit with shortened access time, high retention time and high integration density (Column 5 Lines 14 to 17). It would have been obvious to a person of ordinary skill in the art at the time of invention to use nanotubes in an MRAM cell as taught by Honlein et al. in the device of Shin et al., Zhang et al. and Mao et al. to provide a memory unit with shortened access time, high retention time and high integration density.

#### *Response to Arguments*

5. Applicant's arguments with respect to Claims 1 to 5, 22, 24, 26 and 28 have been considered but are moot in view of the new ground(s) of rejection. In reference to the filing date of Honlein et al., this patent is a continuation of PCT/DE02/02458 filed 4/7/02 (item 63 on face of patent) and therefore, is valid as prior art. See Chapter

1800 of the MPEP. Also, when canceling claims, it is Office policy to list the claim numbers without any text. For example, --claims 6-21 (cancelled)--.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

Art Unit: 2814

8. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [Howard.Weiss@uspto.gov](mailto:Howard.Weiss@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on **(571) 272-1705**.
10. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/368	thru 5/4/05
Other Documentation: none	
Electronic Database(s): EAST, STNEasy, IEL	thru 5/4/05

HW/hw  
4 May 2005



Howard Weiss  
Primary Examiner  
Art Unit 2814